

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
11 August 2005 (11.08.2005)

PCT

(10) International Publication Number  
**WO 2005/073281 A1**

(51) International Patent Classification<sup>7</sup>: **C08G 81/00**,  
C08F 265/10, C08G 63/66, A61K 9/00

(21) International Application Number:  
PCT/KR2005/000207

(22) International Filing Date: 26 January 2005 (26.01.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10-2004-0005586 29 January 2004 (29.01.2004) KR

(71) Applicant (for all designated States except US):  
**SUNGKYUNKWAN UNIVERSITY Foundation**  
for Corporate Collaboration Provost [KR/KR]; 53  
Myeongnyun-dong 3-ga, Jongno-gu, Seoul 100-745 (KR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LEE, Doo-Sung**  
[KR/KR]; Sungkyunkwan University, Cheoncheon-dong,

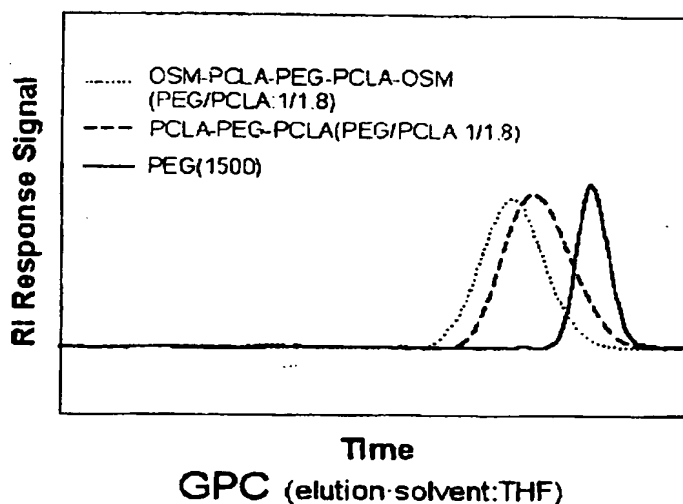
Jangan-gu, Suwon-si, Gyeonggi-do 440-746 (KR).  
**SHIM, Woo-Sun** [KR/KR]; Sungkyunkwan University,  
Cheoncheon-dong, Jangan-gu, Suwon-si, Gyeonggi-do  
440-746 (KR). **BAE, You-Han** [KR/US]; University of  
Utah, 421 Wakara Way, Suite 315, Salt Lake City, UT  
84108 (US). **YOU, Je-Sun** [KR/KR]; Sungkyunkwan  
University, Cheoncheon-dong, Jangan-gu, Suwon-si,  
Gyeonggi-do 440-746 (KR). **KIM, Min-Sang** [KR/KR];  
Sungkyunkwan University, Cheoncheon-dong, Jangan-gu,  
Suwon-si, Gyeonggi-do 440-746 (KR). **PHU, Huynh-Dai**  
[VN/KR]; Sungkyunkwan University, Cheoncheon-dong,  
Jangan-gu, Suwon-si, Gyeonggi-do 440-746 (KR).

(74) Agent: **KIM, Seong-Ki**; 14F., Kukdong Building 60-1,  
Chungmuro3-ka, Chung-ku, Seoul 100-705 (KR).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AF, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,  
MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH,

[Continued on next page]

(54) Title: PH AND TEMPERATURE SENSITIVE HYDROGELS



(57) Abstract: The present invention relates to a block copolymer formed by coupling the following components with each other, as well as a hydrogel composition comprising the block copolymer and a hydrogel formed from the composition: (a) a copolymer of a polyethylene glycol (PEG)-based compound with a biodegradable polymer; and (b) a sulfonamide-based oligomer. The inventive block copolymer shows the sol-gel transition behavior sensitive to changes in not only temperature but also pH. Thus, the inventive block copolymer overcomes the shortcomings of temperature-sensitive copolymers, form a more strong and stable hydrogel, and is stable in vivo. Accordingly, the inventive block copolymer can be used in various applications in the medical and drug delivery fields.

WO 2005/073281 A1



PI., PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**Published:**

— with international search report